

CLAIMS

1. A voltage-driven power semiconductor device comprising:

a voltage-driven power semiconductor element;

5 a collector electrode connected to a collector of said power semiconductor element; and

connection means with an inductance component for connecting an emitter of said power semiconductor element and an emitter electrode.

10 2. A device according to claim 1, further comprising a gate circuit connected to a gate of said power semiconductor element and the emitter electrode plate to apply a driving voltage to the gate and control operation of said power semiconductor element.

15 3. A device according to claim 1, wherein said power semiconductor element comprises a current sense terminal, and said device further comprises a protective circuit for protecting said power semiconductor element in response to a sense signal
20 output from the current sense terminal.

4. A device according to claim 3, wherein, when an excessive current flows into said power semiconductor element, said protective circuit clamps the excessive current to a predetermined current value,
25 and when said power semiconductor element is destructed, releases a current flowing into said power semiconductor element to a reference potential.

5. A device according to claim 1, wherein said power semiconductor element is an IEGT (Injection Enhanced Gate Transistor).

5 6. A device according to claim 1, wherein said connection means has an inductance component of not more than 100 nH.

7. A voltage-driven power semiconductor device comprising:

10 a voltage-driven power semiconductor element;
a collector electrode plate which is connected to a collector of said power semiconductor element and press-contacts said power semiconductor element from the collector side;

15 an emitter electrode plate for press-contacting said power semiconductor element from an emitter side of said power semiconductor element; and

connection means with an inductance component for connecting the emitter of said power semiconductor element and said emitter electrode plate.

20 8. A device according to claim 7, further comprising a gate circuit connected to a gate of said power semiconductor element and said emitter electrode plate to apply a driving voltage to the gate and control operation of said power semiconductor element.

25 9. A device according to claim 7, wherein said power semiconductor element comprises a current sense terminal, and said device further comprises a

protective circuit for protecting said power semiconductor element in response to a sense signal output from the current sense terminal.

5 10. A device according to claim 9, wherein, when an excessive current flows into said power semiconductor element, said protective circuit clamps the excessive current to a predetermined current value, and when said power semiconductor element is destructed, releases a current flowing into said power
10 semiconductor element to a reference potential.

11. A device according to claim 7, wherein said power semiconductor element is an IEGT (Injection Enhanced Gate Transistor).

12. A device according to claim 7, wherein said
15 connection means has an inductance component of not more than 100 nH.

13. A voltage-driven power semiconductor device comprising:

20 a plurality of voltage-driven power semiconductor elements;

a collector electrode plate which is connected to collectors of said plurality of power semiconductor elements and press-contacts said power semiconductor elements from the collector side;

25 an emitter electrode plate for press-contacting said power semiconductor elements from an emitter side of said plurality of power semiconductor elements; and

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a plurality of connection means with inductance elements for connecting the emitters of said plurality of power semiconductor elements and said upper electrode plate.

5 14. A device according to claim 13, further
comprising a gate circuit connected to gates of said
plurality of power semiconductor elements and said
emitter electrode plate to apply a driving voltage to
the gates and control operation of said power
10 semiconductor elements.

15. A device according to claim 13, wherein at least one of said plurality of power semiconductor elements comprises a current sense terminal, and said device further comprises a protective circuit for protecting said power semiconductor elements in response to a sense signal output from the current sense terminal.

16. A device according to claim 15, wherein, when an excessive current flows into said power semiconductor elements, said protective circuit clamps the excessive current to a predetermined current value, and when said power semiconductor elements are destructed, releases a current flowing into said power semiconductor elements to a reference potential.

25 17. A device according to claim 13, wherein said
power semiconductor elements are IEGTs (Injection
Enhanced Gate Transistors).

18. A device according to claim 13, wherein said connection means has an inductance component of not more than 100 nH.

5 19. A voltage-driven power semiconductor device comprising:

a voltage-driven power semiconductor element;

10 a collector electrode plate which is connected to a collector of said power semiconductor element and press-contacts said power semiconductor element from the collector side;

an emitter electrode plate which is connected to an emitter of said power semiconductor element and press-contacts said power semiconductor element from the emitter side; and

15 means with an inductance component arranged near a press surface of said emitter electrode plate against the emitter of said power semiconductor element so as to surround said power semiconductor element and said emitter electrode plate.

20 20. A device according to claim 19, wherein said means with an inductance component is insulated from the emitter of said power semiconductor element and said emitter electrode plate.

25 21. A voltage-driven power semiconductor device comprising:

a plurality of voltage-driven power semiconductor elements;

a collector electrode plate which is connected to collectors of said plurality of power semiconductor elements and press-contacts said power semiconductor elements from the collector side;

- 5 an emitter electrode plate which is connected to emitters of said plurality of power semiconductor elements and press-contacts said power semiconductor elements from the emitter side; and

- 10 a plurality of means with inductance components arranged near press surfaces of said emitter electrode plate against the emitters of said plurality of power semiconductor elements so as to surround said power semiconductor elements and said emitter electrode plate.

- 15 22. A device according to claim 21, wherein said plurality of means with inductance components are insulated from the emitters of said plurality of power semiconductor elements and said emitter electrode plate.

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